

DOCKET NO.: 02-42 US**IN THE DRAWINGS:**

The amended figure 1a is submitted herewith in the sheet, which is marked up as a "Replacement Sheet". The Replacement Sheet includes also unamended figure 1b being presented on the prior version of the sheet.

Figure 1a is amended to show the vibrating membrane 121 of parallelepipedal rectilinear shape as claimed in originally submitted claim 14.

DOCKET NO.: 02-42 US**REMARKS**

The application as filed contained claims 1 through 20, inclusive. Claims 17-20 were withdrawn from consideration, claims 1-11 and 13-15 were rejected on the prior art references cited by the Examiner and claims 12, 16 were objected to as being dependent upon a rejected base claim. Claims 12 and 16 were the subject of objection but indicated as being allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Figure 1a was objected to as not showing the vibration membrane as claimed in claim 14. By this Amendment the Applicant cancels claims 17-20 in response to the election requirements, cancels claims 2-6 and amends claims 1, 7-10 and 13 to better define the invention of the subject patent application and distinguish it from the prior art references. Objection to the drawing was addressed by submitting a Replacement Sheet.

Election/Restrictions

The Examiner applied the restriction requirement to the claims as originally filed requesting to elect for prosecution one of the invention of group 1 (claims 1-16) and group 2 (17-20). Prior to the examination on the merit, the Applicant selected the invention of group 1 for prosecution. By this amendment the Applicant cancels claims 17-20 without prejudice.

Drawing objection per 37 CFR 1.83(a) and §112 rejection

Figure 1 is presumed to be the subject of objection. It is recognized that vibrating membrane 121 appears there as a two-dimensional overlay on an otherwise three-dimensional rendering of the pumping stage. The correction is deemed to be a three-dimensional representation of the membrane 121 and a replacement sheet containing the corrected figure 1 is attached to this paper. The Applicant respectfully requests to withdraw the objection to the drawing and claims rejection under §112.

Rejections per §102 (b)

The distinction of the present work (even before the present amendment) over Quenzer, et al, of record, is to be found in the Quentzer reference. At col. 1, lines 44- col. 2, line 3, there are characterizations of that membrane as "buckled" (line 44), repeated reference to curved "electrodes" (lines 57) and the metallic layer (20d?) of the membrane. The membrane is described as bistable in its buckled condition, e.g., buckled down or up. This is neither a planar membrane nor a vibrating

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membrane. Consider the distinction of oscillation between bistable conditions (two stable states) with passage between a continuum of states. The former is the condition characterizing the Quenzer et al reference, whereas the latter is the only plain meaning of “vibration” as applied to the present work. Possibly, the Examiner can suggest a semantic improvement over the word “vibrate”.

Rejections per §103 (a)

Claims 2-4 were rejected per §103 (a) as unpatentable over Quenzer, et al, as applied to claim 1. Although the Examiner remarked that Quenzer differed in lacking a substrate limited to a silicon wafer, the distinctions further include the planar character of the present membrane and the character of the drive and response. Quenzer applies a dc voltage (or a square wave for repetitive operation). See table 1 and col.5, lines 21-22. The Quenzer membrane “snaps over” (col. 5, line 11) as one expects for a bistable buckled membrane. The distinction over a sine wave driven vibration (capable of resonant response) is therefore evident and appropriate to the bistable operation of a switch-like device.

Claims 5-11 were rejected over Quenzer in view of Cabuz. Here the Examiner recognizes the distinction of a sine wave driven device over the square wave bistable device of Quenzer et al. and points to the Cabuz reference for combination to supply this deficiency. However, the Cabuz reference specifically and expressly rejects a sinusoidal drive at col. 1, line 57 – col. 2, line 3. It is noteworthy that Cabuz finds that the sine wave drive results in “an undesired vibratory motion” when Cabuz is operating upon an actuator much like the Quenzer reference.

Claim 13 was rejected on a combination of Quenzer, et al with Eggleston. The Examiner acknowledges the absence of a spring mounted rigid membrane and then asserts a conclusory remark that “what is claimed is a bellows vibrating assembly”. This conclusion is enthusiastically traversed as plainly without basis. Applicant asserts that this rejection fails for lack of such prima facie showing as required to support a section 103 rejection. MPEP §2142.

Certain contradictory elements are encountered in following the Examiner’s suggested course of satisfying objections to claims 12 and 16. Respecting claim 12, it is noted that alternate embodiments are realized when the membrane may assume either a rectangular, or H shape by claims 8 or 9 respectively, from which claim 12 ultimately depends. Moreover the limitation to sinusoidal drive is equally applicable to the rigid as well as the resilient membrane. Applicant amends claim 1 to limit the fastening of the membrane to the supporting base by specifying the “end regions” of the

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membrane in claim 1 and further specifying such "end regions" in claims 8 and 9. Claims 2-6, inclusive, are incorporated into claim 1.

Conclusion

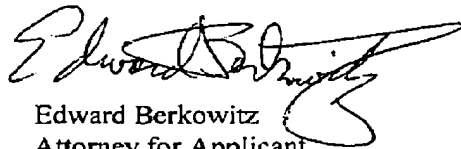
Applicant has amended the claims substantially, and particularly specify the planar character of the membrane (distinct over the buckled membrane of Quenzer, et al, and has limited the driving voltage to a sinusoid in contrast to the square wave of both Quenzer and Cabuz.

Certain contradictory elements are encountered in following the Examiner's suggested course of satisfying objections to claims 14 and 16. Respecting claim 14, it is noted that the membrane may assume either a rectangular or H shape by claims 8 or 9 respectively. Applicant amends claim 1 to limit the fastening of the membrane to the supporting base by specifying the "end regions" of the membrane in claim 1 and further specifying "end regions" in claims 8 and 9. Claim 3 is obviated by incorporation of claim 4 into claim 1.

Claims 7 and 13 refer to embodiments where the membrane is itself resilient, or alternatively, is rigid but supported by resilient members. Applicant has placed the planar character in claim 1 and retained the roles of claims 7 and 13 to distinguish the two embodiments. Applicant believes that the amendments presented address the substance of the Examiner's position while presenting a compact expression of the embodiments originally disclosed and claimed. It is believed that all issues raised by the Examiner were addressed. Applicant respectfully requests to withdraw rejections to the claims 1-11 and 13-16 under 35 U.S.C. § 102(b) and § 103(a), and objections to claims 14-15 under § 112.

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

Respectfully submitted,



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